SCIENCE & GOVERNMENT REPORT

The Independent Bulletin of Science Policy

Vol. V, No. 9 | P.O. Box 6226A, Washington, D.C. 20015 | May 1, 1975

NSF's Allies Aim for a Rescue in the Senate

Following the House of Representatives' recent display of hostility toward the National Science Foundation, NSF's supporters are quietly preparing to ward off similar attacks in the Senate. Though it is generally agreed that they will be successful in scuttling any further assaults on NSF's operations, the mauling that NSF has received so far is cause for more than a bit of alarm.

The hostility surfaced during a three-hour floor debate on NSF's authorization bill in the House last month, when a series of conservatives accused the agency of wasting taxpayers' money on trivial research and of warping childrens' minds by supporting the development of controversial school science courses.

The upshot was that the House tacked a preposterous amendment to NSF's authorization bill which would give Congress the power to examine NSF grants before they are awarded and to veto those it does not like.

Sponsored by Rep. Robert E. Bauman (R-Md.), a self-styled guardian of the public purse and inheritor of the fiscal gadfly functions formerly performed by ex-Rep. H. R. Gross, the amendment would require NSF to submit lists of proposed grants to Congress, and Congress would be able to veto any or all of them within 30 days of the notification.

Along with grant titles, however, Bauman's amendment also asks for "all facts, circumstances and considerations relating to or bearing upon the decision of the National Science Foundation to approve said grants, including to the maximum extent practicable the manner in which the national interest will be fostered by the approval of such grants."

Exactly what criteria Congress should use in judging the scientific worth of the grant proposals, how it should judge the potential payoff for the taxpayer, and what resources would be required to sift through the 14,000 or so grants awarded each year are, however, not addressed in the amendment.

Meanwhile it is instructive to note the factors which led the House to pass the measure. The root of the hostility is to be found in the widespread publicity accorded to some cheap shots that Senator William Proxmire (D-Wisc.) has been taking against NSF programs with trivial or funny-sounding names. Employing the time-honored tactic of firing off press releases ridiculing such grant titles, Proxmire has generated reams of clever prose in newspapers throughout the country.

As a result, members of Congress have been deluged with correspondence from their constituents asking why Congress does not put a stop to NSF wasting the taxpayers' money on such trivial research. Since constituents' mail provides a measure of voter sympathies which few Congressmen lightly ignore, NSF came in for considerable hostility from Capitol Hill.

Bauman himself put the matter in clear terms. "If your office is like mine," he said when introducing his amendment, "whenever one of these articles appears, you get a large volume of letters asking why the government spends money on such projects and why we Congressmen do not do something about it." He added that if Congress passes the NSF authorization bill in the usual manner, "the answer will be "your government spends money on silly projects because your Congress takes an hour to debate an authorization of $700 million and then hands the bureaucrats a blank check."

It is nothing new for NSF's grants to be held up to ridicule—many Congressmen have discovered that such tactics are a sure-fire method of getting their names in the press. But Proxmire's attacks carried more weight this year because NSF found itself caught in the middle of another bitter controversy, this one concerning support of a school anthropology course which has come under fire from several quarters (SGR Vol. V, No. 7).

The two controversies taken together proved to be more than NSF's supporters could defend in the House, and

(Continued on page 2)

In Brief

In response to charges that its granting policies discriminate against younger researchers, the National Cancer Institute (NCI) has produced a study showing that grant applicants under age 35 have a better win record than their elders. In fiscal 1973, 35 per cent of the younger applicants received grants, compared with 25 per cent for those over 35. However, there were many more of the latter, and, on the average, their grants were much bigger than those awarded to the younger group.

The study, published in Cancer Research (March 1975), also notes that in 1974, "NCI awarded more money for its research grant programs than all of the other [9] institutes (with the exception of the National Heart and Lung Institute) obligated for their entire budgets."

Mammoth cost overruns on the Air Force's mammoth C-5A transports continue to continue. Now the Air Force is asking Congress for $897 million to replace the wings on the 77 aircraft in service. Fatigue tests, the Air Force reports, indicate that the present wings will last only about half the 30,000 hours which the planes were designed to fly.

Senate Bill Offers Prizes for Scientific Breakthroughs

The latest bit of science-related nonsense to sprout on Capitol Hill is a scheme for the government to publish annually a list of "Ten Most Wanted Scientific Breakthroughs," the achievement of which would be rewarded with tax-free prizes ranging from $5000 to $150,000.

The proposal, titled, The Science and Technology Awards Act of 1975 (S. 1480), was introduced April 18 by Senators James B. Pearson (R-Kansas) and John Tunney (D-Calif.), with both taking the line that the prizes would help revive the great tradition of the basement inventor. This is desirable, Pearson explained, because the nation's "great scientific research institutions have not been as successful as we once hoped they would be." Apparently reading from the same ghost, Tunney chimed in with, "There is no question that, given the present economic climate, our large scientific research centers have not, and can no longer be expected to, satisfy all of our technological needs."

To deal with that problem, they propose the creation of a 17-member National Science and Technology Awards Council, composed of the heads of most major federal research agencies and offices, plus the Commissioner of Patents, the President of the National Academy of Sciences, and seven public members. The Council would each year decide on what breakthroughs are needed, and select up to 10 winners. The desired breakthroughs would remain on list for 5 years.

In presenting the bill, Pearson noted that at present the highest federal award for science is the non-monetary National Medal of Science, which he described as "a recognition award, not an incentive award."

"Unfortunately," he said, "no scientific award in the United States has the prestige and notoriety (sic) of the Nobel Prize, or the prestige of the Pulitzer Prize in the field of journalism."

Reference was also made to the Nixon Administration's never-explained abandonment of a loudly trumpeted plan to award prizes of up to $50,000 for economically useful inventions. Announced in 1971 in an apparent bid to show that Nixon really cared for the scientific and technical communities, the Nixon prize scheme collected lots of nominations, and it was even rumored that the prize money checks had been written out and stored in a safe in the Office of Science and Technology. But they were never awarded. Though no official explanation was forthcoming, some said that the winners all held high-ranking positions with major corporations, and Nixon's political henchmen decided that wouldn't look too good in an election year.

In any case, the Pearson-Tunney scheme is not likely to go anyplace. If the matter every comes to a hearing, it wouldn't take too much explaining to show that the main impediment to solo invention today is lack of venture capital. Post-invention prizes are not likely to be much help to innovative individuals who can't muster the wherewithal to work on their inventions. If the Senators are really serious about their concern, they might usefully examine the need for long-shot money, rather than after-the-fact prizes.

NSF *(Continued from page 1)*

Bauman's amendment was carried by a vote of 212 to 199.

There is, however, less support for Bauman's amendment in the Senate because, for one thing, the authorization bill for NSF is being handled by Senator Edward Kennedy (D-Mass.), who is strongly opposed to the measure, and for another, a number of prominent scientists have written to their Senators, pointing out how unreasonable the amendment is.

Consequently, Kennedy has proposed an NSF authorization bill devoid of the Bauman amendment, but containing a much weaker clause which should help defuse the issue. The bill is likely to reach the floor intact, and though Bauman has been sounding out the possibility of having his amendment proposed on the floor, opponents are confident that they can defeat such a move.

The weaker clause in Kennedy's bill simply states that the director of NSF must "prepare a comprehensive plan to facilitate the participation of members of the Public in the formulation, development and conduct of the National Science Foundation's programs, policies and priorities and to submit the resulting recommendations, plans and other findings to the Committee on Science and Technology of the House and the Committee on Labor and Public Welfare of the Senate."

In addition to taking some of the steam out of possible moves to tack an amendment on to NSF's authorization bill in the Senate, that clause is also designed to increase public participation in the workings of the National Science Board, whose meetings are now closed to the public, and in NSF's advisory committees.

Another reason why Bauman's amendment is unlikley to be approved by the Senate is that Bauman was hoping for support from Proxmire. Proxmire has, however, announced that he believes the amendment is not the correct solution. A better method to stop NSF wasting money, he says, is to reduce the agency's budget. But that solution is not likely to find much favor within NSF either.–C.N.

Vast PhD Oversupply Forecast in NSF Study

In a report which ought to raise a slew of questions about the nature of graduate science education, the National Science Foundation has estimated that about half the scientists and engineers who will be awarded PhD degrees during the next 10 years will be forced to take jobs unrelated to research and development.

That conclusion is based on projections of the number of scientists and engineers likely to emerge from graduate schools and the number of R&D jobs likely to become available between now and 1985 (*Projections of Science and Engineering Doctorate Supply and Utilization 1980 and 1985*, NSF 75-301, available from Government Printing Office, $1.30). In short, NSF predicts "a trend toward increasing imbalances between supply and utilization" of PhD scientists and engineers in the coming years.

That trend is based on the demographic fact that the college-age population is unlikely to grow much, if at all, during the next 20 years and that in turn will constrain the growth of the academic job market. In 1970, nearly 60 per cent of all PhD scientists and engineers were employed in academe, and so restriction of the university job market will have a marked effect on employment.

Overall, NSF reckons that "between 375,000 and 400,000 science and engineering doctorates will be available to the US economy in 1985, compared to about 295,000 science and engineering positions." And there will be a "significant shift from academic and R&D involvement" into non-academic and non-R&D employment. By 1985 one-third of the entire doctorate science and engineering labor force may be employed outside R&D, compared to less than 10 per cent in 1972, NSF predicts.

That shift means, the report notes, that about half of all the new job openings (resulting from growth and from retirements) will be in non-R&D related occupations, and new doctorates will be more affected than those already in the labor force.

Though there have recently been several criticisms of the accuracy and usefulness of manpower projections, NSF's basic analysis is strongly supported by a number of other surveys. Last month, for example, the Carnegie Commission for the Advancement of Teaching predicted that college and university enrollments are unlikely to grow much between now and 1985, after which they are likely to decline somewhat. And 1974 projections put out by the Office of Education suggest that the net addition to full-time faculty between 1972 and 1982 will amount to about 34,000 which, it should be noted, is fewer than were hired in the single year of 1965. The figure for 1962-72 was 211,000.

The extent of the shift out of R&D will vary from one discipline to another, with the most heavily affected being those disciplines, such as sociology, where PhD employment is most heavily concentrated in the universities. The report also suggests that the supply of doctorates in the life sciences will be in fairly close balance with the number of R&D jobs likely to be available, chiefly because of expanding federal expenditures on biomedical research.

It should be noted, however, that in spite of the growing mismatch between supply and demand, direct unemployment among PhDs is likely to be small. Even during the periods of high general unemployment in the early 1970s and during the past year or so, unemployment among PhDs has been trivial because people with doctorate education can usually find a job, albeit one which may not directly utilize their training.

...Chemists' Future "Ominous"

A survey of job prospects for PhD chemists, carried out by the American Chemical Society, closely matches NSF's projections for scientists and engineers in general. "The long-range outlook for PhD chemists is ominous," ACS states.

Described as "the most comprehensive collection of data ever compiled on the employment situation and salaries of chemists," the survey was published in last week's *Chemical and Engineering News*. Among other findings, it estimates that only half as many PhD chemists will be hired by colleges and universities in 1990 as were hired in 1972.

But PhD chemists will fare much better than chemists with bachelors' degrees. The survey notes, for example, that this summer only about 20-25 per cent of graduates emerging from the universities with freshly minted BS degrees in chemistry and chemical engineering will find jobs related to their education. In the early 1960s, the equivalent proportion was 50 percent.

The shrinking job market has also had a marked effect on salaries. ACS has found that starting salaries for chemists began to decline in 1968 and 1969, and by this year they had dropped, in real terms, to 1962-63 levels.

Prospects for women and minorities in the chemical industries are relatively bright, however. Last year, for example, starting salaries for women chemists topped those of men for the first time.

Social Science: Amid Political Sniping, Internal Criticism

While Congress resounds with mindless debate about federally supported social science projects, it ought to be noted that within the social science profession itself, some truly serious questions are being raised.

Take for example the recent remarks of a Cornell psychologist, Urie Bronfenbrenner, who has spent his career studying children. Bronfenbrenner told colleagues at the American Orthopsychiatric Association meeting in March that there is no point in adhering to traditional research models in such studies. Much traditional research, especially laboratory research, has failed to explain or foster more desirable human development, he said, because it focuses on children outside the social, cultural, ideological and physical context in which they grow.

"Indeed," he said, "it can be said that much American developmental psychology is the science of the strange

Social Science Report

behavior of children in strange situations with strange adults. More correctly, we should say the behavior of one child with one strange adult–typically a graduate student."

Bronfenbrenner called for a new model and perspective for research based on observing children in their habitats. This new research on "the ecology of human development" would deal with the interaction between "the growing organism and the enduring environment or context in which it lives out its life." What's more, ecological research would address questions of social policy as a matter of course. Such questions as "should parents be allowed to bring children to work" and "how important are other adults besides parents" would be studied not only because they are relevant but because they are "essential for the further development of theory and basic knowledge." And, perhaps most importantly, the unabashed goal of such research would be to change things.

Bronfenbrenner's blueprint for new directions in research on children was appended to a massive analysis of social trends which he presented at the meeting. In synthesizing a vast array of the kinds of statistics routinely collected by government agencies–data on the labor force, marriage, divorce, birth, income, household composition, education, homicide, delinquency–and in studying the interrelationships between trends, Bronfenbrenner came up with a startling report on the state of the American child. In short, he found that those factors that make for stability and effectiveness are on the decline and those that indicate vulnerability, isolation and danger are increasing. The most dramatic trend he documented is the progressive disintegration of the family to the extent that there are increasing numbers of children with fewer and fewer adults around to care for them.

While his recent analyses of dramatic social change give urgency to his argument for a new theoretical perspective for research, the idea of an ecological research framework has earlier roots. For more than a decade, Bronfenbrenner pointed out, he and colleagues were engaged in comparative studies of socialization in many countries. During these studies, he found that children brought up in different cultures were markedly different in their behavior, "so much so that one could identify their country of origin on the basis of their behavior with virtually no error." The implications were far-reaching: "the young human organism, it appeared, was exceedingly malleable; there was hope for the future."

Inspired by that work, Bronfenbrenner joined with other colleagues in attempts during the 1960's to build scientific knowledge into social policies and practices affecting this country's children. Some products of this effort were Head Start, a nationwide network of preschools for children from poor families; Follow Through, a national program introducing innovative educational and social strategies into elementary schools; parent-child centers, and other programs. But, as he noted in a recent report to a committee of the National Academy of Sciences, results of those early intervention projects were mainly disappointing.

On one hand, Bronfenbrenner had dramatic cross-cultural evidence that children raised differently behaved differently. On the other, "massive efforts on the part of capable scientists and practitioners to bring about changes in development had yielded differences that could be detected only by refined statistical tests. Moreover, the finding of small differences was not restricted to research on early intervention; it was characteristic of virtually all scientific experiments to date on human behavior and development. Few of the significant effects reported in our scientific journals could have been seen with the naked eye. All required laborious statistical calculation to demonstrate that anything had happened at all."

Such paradoxes led Bronfenbrenner to seriously question existing research strategies and their theoretical underpinnings. Accordingly, he said, he set out to identify the defining properties of the models in use and to conceive possible alternatives. All the while, he was talking to those outside the academic world: political leaders, lawmakers, businessmen, bureaucrats. Those people, said Bronfenbrenner, had the uncanny ability to ask questions about young children, simple questions at that, which he said he couldn't answer. "How important is it for a child to be with its mother during the first three years of life? Can fathers care for young children as effectively as mothers? What is the effect on the child of having the mother as well as the

(Continued on page 5)

Biomedical Research Panel Endorses Study Agenda

The Presidentially appointed group that is supposed to study the condition of the federal health research enterprise has accepted an ambitious staff-written agenda that means either once over lightly or an extension considerably beyond the original reporting deadline of just a year from today (SGR Vol., V, No. 4).

The agenda, which is now the masterplan for what is formally titled the Biomedical Research Panel, calls for nothing less than a definitive inquiry into virtually every aspect of the administration, economics, politics, and scientific underpinnings of all programs sponsored by the National Institutes of Health and the Alcohol, Drug Abuse, and Mental Health Administration. Thus, stated as one among many objectives is "a thorough familiarity with the present administration of the NIH and the ADAMHA and with the relations between NIH and the ADAMHA and the Department of Health, Education, and Welfare, the Office of Management and Budget, the Congress, and with other science agencies."

Another objective is "to understand the content of research presently conducted and supported by the NIH and the ADAMHA, the relation of this research to the state of present research knowledge, and the promise for the future as this research relates to major problem areas–medical and scientific."

Also, "to discern the impact that Federal biomedical and behavioral research programs have on health care and higher education systems, and how their results are integrated into these systems."

To arrive at these and various other understandings, the Panel plans to meet for two days every month. It will be assisted in its work by a staff that now numbers about a dozen professionals, plus several studies that are to be conducted under contract by outside organizations.

Obviously, the agenda reflects either a good deal of fantasy about the difficulties of the task or a tacit understanding that an extension of time will be required.

SOCIAL SCIENCE *(Continued from page 4)*

father work full-time?" Unsurprisingly, said Bronfenbrenner, answers to those and other questions were not to be found in the journals.

"After all," he told his colleagues at the meeting, "you may say there is no reason to expect answers to be found there, for these are questions of social policy rather than of science." But it is just those questions, he argued, which "focus on the impact on the child of the enduring environment in which he lives, or might live, if social policies and practices were altered. It is the principal thesis of this paper that only changes in the enduring environment can produce substantial variation in development."

Bronfenbrenner is careful to state that his criticisms are not intended to undermine other kinds of research. "There are many investigations, not only in laboratories but outside them, which do not meet the criteria I have outlined, but which are of critical importance for our science–and even for social policy." But, they're not enough, he says.

What also is needed, he says, is a multi-dimensional, multi-layered model of the ecology of development which would study the child in his complex world. It would focus on the child in his immediate setting, including physical space and materials, the people around him and their relationships and roles, and the activities of those people as well as the social meaning of those activities. It would focus on the larger social networks and institutions in which the immediate setting is embedded and it would focus on the ideological system that undergirds the immediate setting and the broader social system.

That model, according to Bronfenbrenner, is a far cry from traditional approaches. For instance, the ecological model is concerned with the enduring and familiar contexts in which the child lives. By contrast, many, but not all, laboratory studies involve situations which are ephemeral and unfamiliar, tasks which are unfamiliar and artificial and participants who are strangers to one another. Bronfenbrenner adds that the classical scientific method in psychological research involves isolating the independent effect of each variable taken one at a time, while holding all other variables constant. "Such a procedure assumes a linear model in which the variables are viewed as separable and additive in their effects." The ecological model assumes the world doesn't work that way. It would focus attention on the "simultaneous, non-additive impact of a set of independent variables interacting in non-linear fashion and functioning as an integrated system."

Another difference between the ecological and traditional models would involve the ideological assumptions of investigators and the ideological significance of the social setting, institution, roles, and activities in which the research subjects are engaged. An ecological orientation posits that the ideological meaning of a setting or an act can be of major importance in determining its consequences.

Another departure from traditional research, explains Bronfenbrenner, is that the ecological approach points to the importance of broadening the research focus to encompass relations between systems as they affect the behavior and development of the person. Existing theoreti-

(Continued on page 6)

Defense Science Panel to Assess New Technologies

With political tides running against any major increase in military spending, the Defense Department has convened a group of senior civilian scientists and engineers to identify technologies that are likely to have big military payoffs during the next decade.

Known as the Task Force on Technology Base Strategy of the Defense Science Board, the study group is headed by Norman Rasmussen, of the MIT Department of Nuclear Engineering. Its assignment, according to an announcment in the *Federal Register*, is to "provide guidance on the allocation of technology base resources and identification of technology targets of opportunity . . ."

Rasmussen told SGR that the study is predicated on the assumption that DoD will "have to work with constant resources over the next five years for base technology." The task force will hold its first session May 15-16 in Washington, and also plans to meet with the Defense Science Board–DoD's top science advisory body–for a two-week study in August.

In addition to Rasmussen, who recently directed a massive study of nuclear safety for the AEC, the members are:

Engineering Technology Sub-panel

Eugene Covert, MIT; Willis Hawkins, Lockheed; Bruce A. Reese, Purdue University; Max Williams, University of Pittsburgh.

Electronics and Physical Sciences Sub-panel

Donald C. Forster, Hughes Research Laboratories; Bruce Wald, Naval Research Laboratory; Ben Walker, System Development Corp.

Environmental and Life Sciences Sub-panel

Earl A. Alluisi, Old Dominion University; Charles L. Hosler Jr., Pennsylvania State University; William Raals, St. Josephs Hospital, Wichita, Kansas.

Member at large

Gus Dorough, Lawrence Livermore Laboratory.

Paul Petersen, of the Defense Science Board, serves as executive secretary, His address is: Room 3E114, The Pentagon, Washington, D.C. 20301. Tel. (202) 697-6379.

In Quotes

"The trouble with Nobel prizes is threefold. First, there are clearly not enough to go around, and hence there is bound to be inequity in their distribution. Second, they tend to be confined to a restricted number of subjects, giving a false impression of the relative importance of various fields. Third, they confer an unreasonable amount of credit on their recipients, leading to Merton's well-documented Matthew effect ('to him that hath, it shall be given') and often to the less well-documented Boeing complex ('given the option between jetting around the world lecturing on things you don't know much about and staying at home working, go for the jet-trip any day').

"In certain subjects and certain laboratories one gets the distinct impression that the pursuit of prizes is the ultimate aim, rarely spoken of but rarely very far below the surface. Ambition is a fine thing, but these inequitable, divisive, flattering prizes generate obsession. Isn't it time they were abolished?"

Excerpt from an editorial in Nature, *March 27, 1975.*

* * * * * *

Basic research in the United States has been "superbly supported . . . . In my own field of the brain sciences, I do not know a single competent neuroscientist in the United States who is not adequately funded. Overall, I think that basic science is appreciated and that quality basic research will always be supported."

There is a problem with support of training in basic science "which the National Institutes of Health is well aware of and is trying to correct."

From an interview with Vernon B. Mountcastle, director of the Department of Physiology, Johns Hopkins School of Medicine, in the Johns Hopkins Journal, *Spring 1975.*

SOCIAL SCIENCE *(Continued from page 5)*

cal models and research designs are typically limited to events and processes in a single setting.

Bronfenbrenner points out that there are many obstacles that stand in the way of such research, not the least of which is status quo researcher behavior. "In ironic validation of our ecological thesis, these obstacles also take the form of enduring environments–specifically, of established institutions, roles, and activities that resist alteration of the processes of socialization which prepare and perpetuate researchers in the prevailing mode."

Nevertheless, his model is not a matter of idle dreaming. He and others are already developing a program of research under the auspices and with the support of the Foundation for Child Development in New York. In his work, he has the support of the Foundation's current president, Orville G. Brim, Jr., past president of the social science patron, the Russell Sage Foundation, and author of "Knowledge Into Action," a 1969 report to NSF on improving the nation's use of the social sciences.

If Bronfenbrenner, Brim and like-minded colleagues have their way, the gap between basic social research and explicit implications for political decision-making would narrow substantially.–P.M.

Nuclear Commission Considers Cash Aid for Intervenors

It is still too early to conclude whether the Nuclear Regulatory Commission (NRC) will perform as a puppet for atomic power industry–though such is the general expectation (SGR Vol. V, No. 3). But a sliver of hope that it may act otherwise can be perceived in a small contract that it recently awarded to a Washington law firm.

Without attracting much public notice, the NRC announced the award of $44,000 to the firm of Boasberg, Hewes, Klores, and Kass to study whether the NRC should provide financial assistance for so-called intervenors in NRC administrative and legal proceedings. If the answer comes out yes, which is likely, and the NRC goes along with the recommendation, the result will simply be direct federal subsidy for the anti-nuclear movement. The anti's, of course, have not been doing badly in administrative and courtroom proceedings against nuclear power projects. But the costs of intervening are usually quite high, and with public-interest law in financial trouble because of a decline in foundation support, the NRC bankroll could be a savior.

The NRC's decision to look into the question may be a ploy to confuse the agency's critics, but taking the move at face value, it harmonizes with frequent statements of NRC commissioners to the effect that they intend to be fair and open in determining the safety of nuclear power. When regulatory authority over nuclear power was sliced off from the old Atomic Energy Commission and assigned to the newly created commission, efforts were made in Congress to underwrite the costs of opposition, but provisions for that purpose were dropped in conference. The NRC Act, however, gives the Commission broad authority to do whatever it considers necessary to arrive at licensing judgments, and it is under this heading that it has chosen to look into requests for assistance that were long ago made to the AEC.

As specified in the contract, the law firm will examine various aspects of the question, including what expenses would qualify for reimbursement, limitations on amounts, whether more than one intervenor should receive assistance in a single case, and alternatives to financing the costs of intervenors.

According to NRC lawyers, the only federal precedent for the contemplated assistance is to be found in the Federal Trade Commission, which, as a result of an amendment to its statutory charter last year, is now setting up procedures for financing intervenors in its rulemaking proceedings. The NRC, however, is considering a broader scope, since the study will include both rulemaking and adjudicatory proceedings.

The study is expected to take about three months.

Boasberg, Hewes, Klores and Kass was selected from among five firms that responded to an NRC request for bids on the contract. The study is being directed by Emanuel Boasberg III; address: 1225 19th St., N.W., Washington, DC.

SCIENCE & GOVERNMENT REPORT © 1975 by Science & Government Report, Inc. All rights reserved. Daniel S. Greenberg, Editor and Publisher; Colin Norman, Pamela Moore, Contributing Editors; Margot Daffron, Circulation Manager. Published 22 times per year at 3736 Kanawha St., N.W., Washington, D.C. 20015. Annual subscription rates: institutions, $65; individuals, $44; $17.50 additional for overseas airmail. Second class postage paid at Washington, D.C. Vol. V, No. 9, May 1, 1975.

Data Published on NIH

New editions have just been issued of two extremely informative publications concerning the organization, financing, programs, and history of the National Institutes of Health. Both are available without charge from the Division of Public Information, National Institutes of Health, Bethesda, Md. 20014.

NIH Almanac 1975 (165 pages) is the first publicly available edition of a detailed collection of information that NIH has previously assembled mainly for the use of its administrators and public affairs specialists. The *Almanac* contains brief histories of each institute, biographies of past and present senior administrators, legislative authority for NIH programs, statistics on staffing and appropriations, and various other information.

Basic Data Relating to the National Institutes of Health 1975 (58 pages) is a pocket-size pamphlet focused mainly on the financial and statistical data contained in the *Almanac*.

Subscription Form

Science & Government Report
Northwest Station
Box 6226A
Washington, D.C. 20015

☐ Renew my subscription ☐ Check enclosed
☐ Enter my subscription ☐ Please bill

Institutional subscribers: one year, $65 ☐; two years, $120 ☐
Individual subscribers: one year, $44 ☐; two years, $75 ☐

(Overseas airmail, $17.50 per year additional.)

Name_____

Address_____

_____

Zip

Arms Control Chief Deplores Nuclear Spread

Last week, in a major address that went virtually unreported by the general press, the Director of the Arms Control and Disarmament Agency, Fred Iklé, offered a somber assessment of the prospects for controlling the spread of nuclear weapons. Noting that the means for making the bomb are rapidly being diffused around the world, Iklé said that there is little that the United States can do to halt the spread of nuclear technology.

That fact, Iklé argued, calls for a fundamental readjustment of military and arms control policy and for new international arrangements for ensuring that nuclear power technology is not converted to military use.

The address, delivered April 23 at the US Naval Academy, is particularly noteworthy since it came on the eve of Senate hearings on a bill, opposed by the Administration, to control the export of nuclear technology from the United States. Moreover, Iklé's statements almost certainly reflect the position that will be adopted by US delegates to the international meeting called to review the nuclear non-proliferation treaty later this month.

Proceeding from a brief account of recent arms control activities, Iklé stated that a new approach is needed because "we are now moving into an era that will differ fundamentally from the world to which we have, in part, adjusted. The revolutionary agent is the inexorable diffusion of nuclear technology throughout the world. We can slow down the spread of the means to make the bomb; but we–the United States–cannot stop it." The result, Iklé warned, will be that "the most dangerous material man has ever fashioned will gradually spread all over the world.

"In the coming era, we will no longer be able to prevent use of the nuclear bomb solely by deterring one or two potential adversaries. Further, we will no longer be able to curb nuclear arms competition through *bilateral* agreements alone," Iklé suggested.

Since most nations that acquire nuclear weapons will insist on retaining sovereign control over them, Iklé argued that general and complete disarmament is not a guideline to shape arms control policies. "Yet," he continued, "realism forces us to recognize that the continuing spread of nuclear materials cannot coexist, for decades, with the present structure of nuclear deterrence, on the one hand, and the present fragile controls over nuclear explosive technology on the other."

Echoing a theme he sounded in a recent speech (SGR Vol. V, No. 5), Iklé pointed out that "military strategists may wish to speculate on how nuclear deterrence, as we now understand it, could survive in a world with several dozens of nuclear powers, and where even criminal groups might obtain nuclear bombs."

But, having provided that sobering assessment of the prospects of proliferation of nuclear technology, Iklé was much less specific in detailing the shifts in military policy that will be needed to cope with the situation. He launched into the usual generalities, such as "America's self-interest dictates that we sustain our alliances" because "to the degree that we appear to turn inward, we encourage non-nuclear nations–from Asia to Europe and the Middle East–to create their own nuclear forces."

Finally, he echoed the traditional line that improvements are needed in international control of nuclear technology, to ensure that reactors are not used for military purposes.

Nowhere, however, did Iklé mention proposals to sell US nuclear technology to Egypt, Israel, South Korea, South Africa, and other unsettled areas of the world. And, like his previous warnings about nuclear terrorism, his speech has been widely ignored.

Science & Government Report
Northwest Station
Box 6226A
Washington, D.C. 20015

Second class postage paid at Washington, D.C.

-00006 99/99
XEROX UNIV MICROFILMS
300 N ZEEB RD
ANN ARBOR MI 48106